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Mechanisms and Speciation 1: The Modern Synthesis

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The Modern Synthesis (aka neo-Darwinism)

The Modern Synthesis:

The Modern Synthesis or Synthetic Theory of Evolution is an explanation of evolution that is based on modern genetic principles. According to the Modern Synthesis (a.k.a. Neo-Darwinism):

- 1) Evolution occurs (i.e., populations gradually change genetically over time) as a result of two sets of processes. The first set includes mechanisms that produce or enhance genetic variability within a population over time, and the second set includes mechanisms that decrease genetic variability within a population over time (see bottom half of page).
- 2) Divergent speciation (i.e., the splitting of one lineage into two) occurs when populations of the same species become reproductively isolated (often as a result of geographic separation) for an extended period of time and, consequently, diverge genetically.

The following mechanisms produce or enhance genetic variability within a population over time:

- a) mutations
- b) genetic recombination (e.g., sexual reproduction)
- c) gene flow

The following mechanisms decrease genetic variability within a population over time:

- a) natural selection
- b) genetic drift (especially in small populations)